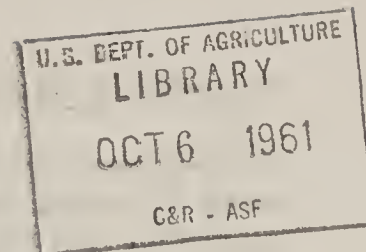


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UNITED STATES DEPARTMENT OF AGRICULTURE
Rural Electrification Administration
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Letter No. 27

TELEPHONE ENGINEERING INFORMATION

These information letters are intended to provide a means for answering questions that arise in the field and to inform the field of new developments. They are not intended to be instructions nor to replace in any respect the presently approved channels for establishing requirements and procedures.

TE and CM Sections Distributed Since Letter No. 26, February 1961

Rev. TE and CM-102, Numerical Index
Add. 5, TE and CM-205, Preparation of an Area Coverage Design (BSPR)
Rev. TE and CM-325, Application Guide for Preparation of Detail Dial
Central Office Equipment
New TE and CM-327, Application Guide for Preparation of Part III, Specifications for Detailed Direct Distance Dialing
Add. 1, TE and CM-821, Multipair Distribution Wire Protection
Rev. TE and CM-830, Electrical Protection Assembly Units

Alphabetic Indexes

Two alphabetic indexes are in preparation covering publications of REA. One index will contain information for borrowers and will include references to Bulletins but not to Staff Instructions. The other index, for internal use, will include Staff Instruction references. The subjects indexed will include engineering information from TE and CM's and TOM's and references about accounting, loans, operations, specifications and contracts.

Line Wire, 0.080 Inch Diameter, 25% Conductivity, Copper-Covered Steel - Uninsulated

An addendum to REA TE and CM-615, "Design of Open Wire Plant," is in preparation to provide data for the application of 0.080 inch diameter, 25 percent conductivity, copper-covered steel uninsulated wire in both joint and nonjoint construction. This wire will permit economical construction with spans as long or longer than larger diameter and heavier wires of equal strength. This new wire has passed the vibration tests successfully at the Bureau of Standards and has been placed on the REA "List of Materials Acceptable for Use on Telephone Systems of REA Borrowers," listed under "Copper-Covered Steel - Uninsulated" as "25% EHS" wire.

Five-Party Rural Multiparty Service

Five-party rural multiparty service with one and two-party urban service has been approved by REA as an alternative to eight-party rural multiparty and one, two and four-party urban service, where feasible. The newly approved services are for consideration for both initial design and redesign by upgrading existing telephone systems. The decision was based on extensive comparative cost studies of the two service arrangements. These studies determined that the rate schedule increase for five-party instead of eight-party service will be only about half as much per station as when the change is made in existing dial offices.

In the design work the recommendations include design based on a "circuit-by-circuit" approach, standardization of terminal-per-station central office equipment and multifrequency bridged ringing. In redesign of existing plant a resurvey is considered essential. All the possible means for reinforcing existing plant are to be considered including carrier, cable and wire. Higher outside plant fills will be required where existing TPL offices are retained when converting eight-party to five-party service.

Appropriate sections of the TE and CM will be reissued to reflect the new engineering criteria.

Figure 8 Distributing Wire

The development of Figure 8 Distributing Wire was mentioned in Information Letter No. 26, February 1961, under the title "Integrated Messenger (IM) Cable and Wire." Since then this product has acquired the more familiar title of "Figure 8." A packet, dated June 1961, has been issued providing instructions for the proper installation of one, three, six and twelve-pair Figure 8 distribution wire. The packet, for inclusion in Form 511, contains: (a) Contractor's Proposal Sheet for DW-J Assembly Units; (b) Description of Assembly Units; (c) Proposal and Contract Sections; (d) Part III - Specifications for Construction and Installation; (e) Assembly Unit Drawings; (f) Guide Drawings; and (h) Current List of Accessory Materials for Figure 8 Distribution Wire Construction. REA has advised borrowers that it will consider approval of a limited quantity of these distribution wire products for field trial, providing evaluation by REA of the manufacturer's product indicates that they appear to be satisfactory for trial purposes.

Notes on Distance Dialing - 1961 Revision

"Notes on Distance Dialing" is the title of a blue covered book issued by the AT&T Company. The issue dated 1956 is under revision and will be made available to the non-Bell telephone industry, including REA, in the fall of this year. The reissue is being made to include additional material and expand and clarify the discussion on certain subjects. There have been some changes in basic plans in Nationwide Dialing. The numbering plan area code assignment charts and planning maps have been brought up to date. The "Notes" furnish much information needed by the telephone industry for the successful coordination of efforts between manufacturing and operating companies in furthering distance dialing.

"Loop-around" Test Lines in "End Offices" (Class 5)

A transmission test arrangement for toll connecting trunks between "end offices" and their toll centers is a feature in distance dialing. "Loop-around" equipment can be installed at "end offices," which is the classification of nearly all of REA borrowers' dial central offices. REA has developed an arrangement for end offices that can be provided at modest expense for testing the trunks for transmission losses between these offices and their toll centers.

In this arrangement for two-way trunks a subscriber line number is dialed up over a trunk from the Class 4 office which connects a one milliwatt power source to the trunk at the Class 5 office. The transmission loss of each trunk in this direction of transmission is measured in this manner. Then, while using one trunk as the reference trunk, a second subscriber line number assigned to the end office test equipment is dialed up over another trunk from the toll center. This connects this trunk to the reference trunk at the Class 5 office in a "loop-around" arrangement and test power is sent out over the trunk under test from the Class 4 office and received and measured at the Class 4 office. By knowing the far-to-near loss of the reference trunk and the overall measurement of the two trunks, the near-to-far loss is found by subtraction.

"Loop-around" testing of one-way connecting trunks between an end office and its toll center with this arrangement requires the assistance of an attendant at the end office to set up connections between trunks by the use of patching cords inserted in test jacks. The attendant does not have to be familiar with transmission measuring techniques.

The required frequency of this trunk testing will probably be on a quarterly basis for carrier equipment and semi-annually for voice frequency repeaters.

This equipment also includes a feature whereby by dialing another number in the Class 5 office from the toll center a 900 ohm termination can be placed across the trunk circuit. This termination is used for making noise measurements and other voice frequency trunk transmission tests.

Trunk Carrier Developments

REA is planning field trials of low cost carrier systems for trunk cables. These include the Kellogg K-24, Panhandle X and the Lenkurt 81A systems.

Elimination of Automobile Ignition Interference to Mobile Radiotelephone Service

Motorola has developed an arrangement, moderately priced, which will eliminate automobile ignition noise picked up by mobile radiotelephones.

Multiplex Microwave Equipment

A 44 channel installation known as the Kellogg K-24R system is in use by the Port St. Joe Telephone & Telegraph Company (Florida 502) which is a low-cost, four-wire circuit plan capable of a maximum of 96 channels. It

is used in links 25 to 30 miles in length and is a double-sideband, carrier-suppressed system with 16 kc spacing between channels. It is a modification of the K-24 trunk carrier system.

General Electric Company Full Duplex Mobile Radio

The General Electric Company has developed full duplex mobile radio equipment. A field trial of this equipment is desired.

Repeatered Carrier Installation on Buried Plant

The Wickstrom Telephone Company (Minnesota 520) has made a seven channel subscriber line repeatered carrier installation on buried plant, extending 13 miles from the central office to the distant terminal. The circuit has 7/10 mile of 24-gauge buried cable, 1-1/2 miles of 22-gauge buried cable, 7.2 miles of 19-gauge cable and 3.7 miles of 19-gauge buried wire. Three repeaters are spaced along the circuit, powered over this same circuit from the central office or the terminal. The repeaters each give 40 db gain at the highest frequency which is 304 kc. The frequency spacings are between 48 kc and 304 kc. Beyond the distant terminal the circuits are all loaded buried wire or cable. Transmission tests have been made on this installation and the results are encouraging. At a later date a recommendation may be made on this type of installation for longer buried plant routes.